

# Exhibit A

	<b>Disclosure SJO8-1999-0443</b>
<b>Created By:</b> Kevin Smith <b>Created On:</b> 12/13/99 12:59:01 PM <b>Last Modified By:</b> Marie Turley <b>Last Modified On:</b> 02/14/2000 02:39:07 PM	
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Required fields are marked with the asterisk (\*) and must be filled in to complete the form.

### Summary

Status	Search Results Received
Processing Location	SJO
Functional Area	Test & Performance Systems - Truskowski
Attorney/Patent Professional	Randall J Bluestone/San Jose/IBM
IDT Team	Ciod Barrera/San Jose/IBM; Brian Smith/San Jose/IBM; Wynn Price/San Jose/IBM; Hornayoun Samadi/San Jose/Contr/IBM
Submitted Date	12/13/99 03:43:08 PM
Owning Division	SSD
PVT Score	To calculate a PVT score, use the 'Calculate PVT' button.
Lab	
Technology Code	

### Inventors with Lotus Notes IDs

Inventors: Kevin Smith/San Jose/IBM

Inventor Name > denotes primary contact	Inventor Serial	Div/Dept	Manager Serial	Manager Name
Kevin Smith	156051	35AP35A	423630	Smith, R.J. (Brian)

### Inventors without Lotus Notes IDs

#### IDT Selection

Not Yet Selected	Attorney/Patent Professional
Ciod Barrera/San Jose/IBM	Randall J Bluestone/San Jose/IBM
Brian Smith/San Jose/IBM	
Wynn Price/San Jose/IBM	
Hornayoun Samadi/San Jose/Contr/IBM	

Response Due to IPET - 01/13/2000

#### Main Idea

Title of Disclosure (in English)

Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache

Idea or Disclosure

1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

Given an existing LRU cache for which it is impossible, or not desirable, to alter in such a way as to efficiently accommodate sequential-oriented prefetched data this invention describes a process for prefetching data in such a way as to work efficiently with random accesses in said LRU cache.

Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache - continued

The advantage of this technique is that it is not always possible, or desirable, to alter the replacement algorithm of an existing LRU cache. This invention is designed to work with a preexisting LRU cache without alteration. This applies even when the LRU cache is across a physical boundary, such as a computer host attempting to make use of the cache within an I/O subsystem for efficient caching of prefetched data.

2. How does the invention solve the problem or achieve an advantage, (a description of "the invention", including figures inline as appropriate)?

The invention describes a process for estimating the single reference residency time of elements within a cache and then using that information to model the utility of keeping prefetched data for I/O streams which are expected to benefit from cache prestaging.

The I/Os eligible for signalling prefetching are recorded in a computer model. Because of the single reference residency prediction the number of simulated prefetches remains relatively small. A sequential prefetch "count" is recorded with each element in the computer model, providing a basis for decision with regards to invoking an actual prefetch into the LRU cache in question. A measure of "goodness" (based on this "count") for prefetching exists such that the threshold value for prefetching eligibility can increase or decline depending upon the LRU cache's hit-ratio performance.

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?

I am not aware of prefetching algorithms which do not require some degree of modification to the LRU cache being prefetched into. A common "solution" is to maintain a sequential "count" (as described above) with each cache element, thus providing a measure of "goodness" for prefetch eligibility, however in every case that I am familiar with the "count" information needs to be added to the cache element information comprising the LRU cache, thus requiring a modification to the LRU cache in question.

4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.

This invention is not currently implemented in any product. I have an internal prototype which implements the algorithm. This internal prototype which is not associated with any specific product was created on 12/10/1999.

**\*Critical Questions ( Questions 1 - 7 must be answered)**

**Question 1:**

On what date was the invention workable? 12/10/99. Please format the date as MM/DD/YYYY  
(Workable means i.e. when you know that your design will solve the problem)

**Question 2:**

Is there any planned or actual publication or disclosure of your invention to others outside IBM?  No  Yes

If yes, enter the name of each publication or patent and the date published below.

Publication/Patent:

Date Published or Issued:

Are you aware of any publications/patents that relate to this invention?  No  Yes

If yes, enter the name of each publication/patent and the date published below.

Publication/Patent:

Date Published or Issued:

**Question 3:**

Has the subject matter of the invention or a reproduction incorporating the invention been sold, used, or made available in manufacturing, without need for sale, or included in a proposal?  No  Yes

Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache - continued

Is a sale, use in manufacturing, product announcement, or proposal planned?

Yes  No

If Yes, identify the product if known and indicate the date of planned date of sale, announcements, or proposal and to whom the sale, announcement, or proposal has been or will be made.

Product:

Version Number:

Code Name:

Date:

To Whom:

If more than one, use cut and paste and append as necessary in the field provided.

**Question 4**

Was the subject matter of your invention or a product incorporating your invention used in public (e.g., outside IBM or in the presence of non-IBMers)?

Yes  No

If Yes, give a date (please format the date as MM/DD/YYYY).

**Question 5**

Have you ever discussed your invention with others not employed at IBM?

Yes  No

If Yes, briefly provide name and date discussed. Fill in the text area with the following information: the names of the individuals, the employer, date discussed, under CDA, and CDAw.

**Question 6**

Was the invention, in any way, started or developed under a government contract or project?

Yes  No  Not sure

If Yes, enter the contract number.

**Question 7**

Was the invention made in the course of any alliance, joint development or other contract activities?

Yes  No  Not sure

If Yes, enter the following: Name of Alliance, Contractor or Joint Developer  
Contract ID number:  
Relationship contact name:  
Relationship contact E-mail:  
Relationship contact phone:

**Question 8**

Have you submitted, or are you aware of, any related disclosure submission?

Yes  No

If Yes, please provide the file and docket or disclosure number below.

Efficient mixing of sequential prefetches with random access data in a preexisting LRU cache - continued

#### Question 9

What type of companies do you expect to compete with inventions of this type? Check all that apply.

- Manufacturer of computer servers
- Manufacturer of memory devices
- Manufacturer of disk drives
- Manufacturer of PCs
- Non-computer manufacturer
- Developers of operating systems
- Developers of networking software
- Developers of application software
- Integrated solution providers
- Service providers
- Other (Please specify below)

#### Patent Value Tool (Optional - this may be used by the Inventor and attorney to assist with the evaluation)

(The Patent Value tool can be used by you or the evaluation team to determine the potential licensing value of your invention.)

The Patent Value Tool has not yet been used to calculate a score.

#### Evaluation

This evaluation was entered by Sarah Hauney/San Jose/Complaint on 01/14/2000

#### Team Evaluation

What is the teams evaluation of this disclosure? Search

Date rated: 01/14/2000

Evaluation comments:

#### Search Information

Date search initiated	Target completion date	Actual completion date
Who was the search sent to? This area is to designate a local Searcher or WAPEL-SAM		
Send search requests to:	Search type:	
Date of communication: 01/14/2000	<input checked="" type="checkbox"/> Patentability <input type="checkbox"/> Clearance <input type="checkbox"/> Validity <input type="checkbox"/> Stability	
Address where communication is to be sent:		
Comments to be included in the Disclosure: PLEASE NOTE: ADDITIONAL INFORMATION IS FOLLOWING WAPEL-SAM		

#### Post Disclosure Text & Drawings

Enter any additional information relating to this disclosure below:

(Form Revised 12/17/97)